International Journal of Applied and Natural Sciences (IJANS)
ISSN 2319-4014
Vol. 2, Issue 4, Sep 2013, 67-72

International Academy of Science, Engineering and Technology
Connecting Researchers; Nurturing Innovations

MANUFACTURING A DEVICE FOR TREATMENT OF HEAVY WATER AND SALT WATER USING EVAPORATION TECHNIQUE

SHAYMAA ABBAS ABDULSADA[1] & HAIDER AQEEL MOHAMMED[2]

[1]College of Engineering, University of Kufa, Kufa, Najaf, Iraq

[2]College of Materials Engineering, University of Babylon, Babylon, Iraq

ABSTRACT

The rising problem of water pollution are threatening public life in all its aspects. Where sewage has become increasing day after day and in large quantities is no secret they carry viruses and bacteria a large and growing danger when he received in rivers without treatment. There is also the problem of a salt water from wells and lakes. The aim of this study device innovation to address the heavy water and salt water and transferred to safe water using evaporation technique. Been reached through this innovation to the possibility of heavy water treatment and salt and turn them into water unfit for human consumption, industrial and agricultural terms, the results showed when compared before and after treatment makes a big difference in chemical analysis

KEYWORDS: Water Treatment, Heavy Water, Salt Water, Evaporation Technique

INTRODUCTION

There is no doubt that water is the lifeblood and the most important component of its components, a key element for the stability and prosperity of his or her own human and wherever there is water, there are aspects of life. The salt water about 97% of the volume of water overall and are found in the seas and oceans and some lakes and waterways The freshwater represents the remaining part, which up to 3% and concentrated water in rivers, ponds, most lakes and underground, forming icebergs in the polar regions the bulk of the water freshwater available for human use, which represents approximately 1.6% of the total volume of water. This ratio is not fixed, especially with the high proportion of salt increased in many lakes and water bodies fresh closed or semi-closed this part of which relate to waters with sea salt on the other. As the salt water unfit for human use as is, and must be converted to fresh water. [1]

As a result of the evolution of large industrial water is exposed to many contaminants, making it unfit for drinking. Examples of acid rain and pollution as well as sewage and industrial and agricultural. People were in the past throwing waste and waste in rivers and oceans thinking that they purify themselves in between 1849 and 1853 spread the cholera epidemic in London due to contamination of the waters of the Thames River has led to the death of a large number of people in London and its environs. And repeated the same tragedy in other European cities also spread in some American cities and typhoid epidemic in the same period.

As well as the back of the pollution of sea water and rivers and groundwater petroleum substances, radioactive materials and heavy metals and others.The pollution petroleum dangerous substances on the water where a thin layer over the surface of the water to prevent air penetration and carbon dioxide and light into the water and thus become aquatic life almost impossible.And lasts hydrocarbons resulting from oil pollution long in water and does not integral to bacteria and accumulates in the bottom of the sea. The oil contains carcinogenic substances like benzopyrene which there is a high proportion in the Gulf Oil, Libya and affect the plants and animals that feed on them. [2]

Types of Water

Surface Water

Water that is present on the surface of the Earth's crust to be readily available for use and are divided according to the salinity to:

Salt Water

Is water that contains a high degree of salinity because they contain large amounts of dissolved mineral salts. The seas and oceans main source of salt water.

- **Fresh Water**

Water that is characterized by how little the amount of salts or even non-existent in some cases are the rivers and streams and polar ice and rain the main source of fresh water.

- **Ground Water**

It waters that are in the ground (under the earth's crust) may be fresh or salt, is distinct from other water as less susceptible to contamination RoHS factories and sewage, but in the modern era did not leave her rights, but dumping of toxic waste and radioactive in the ground reaching effects them into groundwater tarnished.

Water Pollution

Water pollution is intended to disrupt the water quality of rivers and drains water, seas and oceans as well as rain water and groundwater wells, making the water unusable.The contaminated water through waste humanity and plant or animal or mineral, industrial or agricultural or chemical draining into the water sources (water bodies of the seas and oceans and rivers and banks agricultural), and contaminated groundwater as a result of leakage of chemicals and also sewage it, including bacteria and revive minutes. And I knew the World Health Organization (WHO) Water pollution: "as any change to the elements in combination, either directly or indirectly due to human activities", which makes the water less validity Purpose natural allocated to them, some, or in other words a "changes that occur in the natural properties of water, biological and chemical water, making it unfit for drinking or household use, industrial and agricultural"[3]

Sources of Water Pollution

Industrial Sources

Containing plants and waste water accounted for 60 percent of the total contaminated material of the seas, lakes and rivers. The issue most pollutants from factories such as tanning factories, lead, mercury, copper, nickel and paint factories, cement, glass, detergents and sterilizing dairy factories, slaughterhouses and sugar refineries. In addition to hydrocarbon pollution resulting from oil pollution.

Most factories in developing countries and even developed countries do not adhere to industrial wastewater controls, but receive your wastes in water. In the United States, and found toxic waste in rivers and seas surrounding factories. In Cairo, a study was conducted on twelve plant for the treatment of drinking water and found all of which suffer from lack of discipline in the discharge of industrial effluents.It should be noted that the traditional methods of water purification do not eliminate the industrial pollutants (such as hydrocarbons) and inorganic contaminants, pesticides and other chemicals different. The user interacts chlorine to sterilize water with hydrocarbons carbohydrate component Klorenah precancerous. And other forms of industrial pollution is the use of some factories and power plants of the waters of rivers and lakes in the cooling system, and the resulting rise in water temperature, which negatively affects the biochemical reactions in water as well as aquaculture.[4]

Sources Sanitation

The sewage and one of the most serious problems on public health in most third world countries, because most of these countries do not have integrated sewerage network, but in some big cities there is no sewerage system and the biggest example of this city of Jeddah. The biggest problem when receiving coastal cities sewage into the sea without treatment, causing serious health problem. The use of septic tanks in places where there is no sewerage system has harmful effects on public health, especially if left exposed or thrown offal in places near houses where breeding of mosquitoes and flies, which cause a lot of diseases in addition to the use of household pesticides that have harmful effects on health rights. Sewage water contains a large amount of organic material, and huge numbers of microorganisms aerobic and anaerobic. Upon arrival to the surface water, working aerobic microorganisms on oxygen consumption for the analysis of organic materials, causing a shortage of oxygen, leading to suffocation organisms that live in the sea and her death. When death begins bacteria or anaerobic microorganisms analyzed updated rot and other corrupt former.

The degree of corruption surface and suitability for use on several factors, including:

- Speed stream of water in the waterway
- The amount of oxygen dissolved in water
- The speed with which you can certain types of bacteria analysis of these impurities and waste
- The extent of impurities, which receive waste in this body of water and quality of sea[5]

Wastewater Components

Wastewater consists of water used in homes, whether in bathrooms or kitchens, as well as water used in some small workshops and factories and gas stations located within the city. Wastewater containing a high proportion of water 99.9 and remaining solids on the colloidal materials and stuck and dissolved. These compounds are:

- Carbohydrates: sugars include unilateral, bilateral and starch and cellulose
- Organic acids: such as formic acid, and other Broponik
- Salts of organic acids
- Fats
- Organic compounds Alntroyjah include proteins
- Dyes
- Mineral salts
- Other material

Methods of Treating Wastewater

Processed Sewage on Several Steps

- **Primary Treatment:** where to get rid of suspended solids and solid manner filtration and sedimentation
- **Secondary Treatment:** using biological methods such as bacteria that oxidize organic materials
- **Tertiary Treatment:** a final treatment and disposal of bacteria, viruses and organic materials after sewage treatment can be used in agricultural or industrial purposes.

- **Agricultural Sources:** Increased in recent use of pesticides and chemical fertilizers in agriculture, drifting section of this material with rainwater irrigation water to reach the surface water and groundwater, causing serious chemical contamination of water sources [6]

EXPERIMENTAL PART

Been in this part to create the necessary materials needed to complete the manufacture of the device, where the device consists of two reservoirs are:

- **The First Reservoir:** Contains inside several perforated breaks and these holes smaller than gradually closer to the end of the tank.
- **The Second Reservoir:** The inside contains metal several Heaters and also Thermocouple

Also of material that has to be configured are metal tubes for the purpose of connecting the reservoirs with some pipes and also graduated from the second reservoir used for the exit of steam and condensed and converted into water Is initialized the above materials are then assembled for the purpose of completing the process of manufacturing the device becomes as in Figure 1, where the device is installed after the completion of manufacturing in the nearby salt water or muddy for the purpose of processing.

Working Method

After placing wastewater in the tank first, they will pass through the barriers perforated and less holes gradually for the purpose of water filtration and reduce pollutants least possible proportion of then graduated from the end of the tank to pass through the tube and this tube connects the reservoir II, which contains inside to Heaters for the purpose of heating water entering it. After heating water to a temperature in the second reservoir evaporation, it will come out steam from the top through a tube tied at the top of the tank and passes through this tube and passes through will condense into cold water. Can be buried underground pipes for the purpose of facilitating the process of losing heat and steam to intensify and turn it into pure water.

Figure 1: Process of Manufacturing the Device

RESULTS AND DISCUSSIONS

After treating the muddy water and salt water this device factory results proved that the resulting water after treatment have a high purity through a chemical analysis of the water before and after treatment and comparing the results

CONCLUSIONS

Was reached the following conclusions of this device:

- The possibility of processing salt water into pure water drinkable.
- The possibility of heavy water treatment and turn it into clean water suitable for industrial and agricultural use

REFERENCES

1. Saad Hamoud Radi "study of heavy Awalnaderh the elements in soils (farmland)," the Ministry of Environment, Department of Environment Baghdad, Department of natural ecosystems, Division of farmland.
2. Nazir Ismail and Yasser Mohammad and beautiful Fallouh "changes the quality of groundwater as a result of the use of treated wastewater to irrigate the area East Gouta", Damascus University Journal for Basic Sciences Volume (20) the second issue. 2004
3. Hazim F Mahmoud al-Naimi "examine the raw water pollution and its impact on the water quality of the liquefaction station Alksr / north of Iraq," Iraqi Journal of Earth Sciences, Volume 10, Issue 1, pp. 23 - 32, 2010.
4. Eng. Nawar Jaleel Hashim "The problem of water pollution in Iraq and future prospects," studies and research the Arab world, Issue 17
5. Anfal Said David, the geographical distribution of pollutants affecting the Tigris River between the country and the cities, Master Thesis, Faculty of Arts - University of Baghdad, 2000.
6. ARIJ Ali Mohamed Baeshen, the "assessment of the impact of wastewater on the vegetation east of Jeddah," the College of Education / Departments, King Abdulaziz University, 2008.